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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,855	03/12/2004	Hisashi Amaya	12054-0024	6672

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CLARK & BRODY
1700 Diagonal Road, Suite 510
Alexandria, VA 22314

EXAMINER	
ROE, JESSEE RANDALL	
ART UNIT	**PAPER NUMBER**
1733	
MAIL DATE	**DELIVERY MODE**
01/24/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,855	AMAYA ET AL.	
	Examiner	Art Unit	
	JESSEE ROE	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 13-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 13-20* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 1-8 and 13-20 are pending wherein claims 1-8 and 13-20 are amended.

Status of Previous Rejections

The previous rejection of claims 1-4 and 13-16 under 35 U.S.C. 103(a) as being unpatentable over Oka et al. (US 5,232,520) is withdrawn in view of the Applicant's amendments to claims.

Claim Objections

Claim 13 is objected to because of the following informalities: The status identifier of claim 13 is (previously presented). However, the claim has been amended to omit the phrase "with a plastically processed history" and has been amended to add the phrase "and a yield strength of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 and 13-20 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to the added recitation “a yield strength of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted” in claims 1-8 and 13-20, the Examiner notes that Table 2 discloses steel alloys that have a yield strength below 815 MPa and thus there is not support for the recitation “a yield strength of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa”. Additionally, the Examiner notes that the specification does not provide support for the recitation "wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted”.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to the added recitation "a yield strength of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted" in claims 1-8 and 13-20, the Examiner notes that the claims define no upper limit for the yield strength and therefore the scope of the claim is indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-8 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oka et al. (JP 11-310823).

In regards to claims 7-8, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown on the following page (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	0.005 – 0.5	0.001 – 0.05	0.005 – 0.05
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 7-8, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1

point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 7 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 8, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. (JP '823) such that the formula would be satisfied because Oka et al. (JP '823) discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 7 of claims 7-8, Oka et al. (JP '823) discloses the presence of impurities (abstract).

With respect to the added recitation "and a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted" in claims 7-8, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not

higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

In regards to claims 19-20, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown below (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	0.005 – 0.5	0.001 – 0.05	0.005 – 0.05
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the

compositions disclosed by Oka et al. (JP ‘823) because Oka et al. (JP ‘823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the hardness range of 30 – 45 HRC and “the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 19-20, the Examiner notes that Oka et al. (JP ‘823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and “the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 19 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 20, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. (‘520) such that the formula would be satisfied because Oka et al. (JP ‘823)discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 7 of claims 19-20, Oka et al. (JP

‘823) discloses the presence of presence of impurities (abstract).

With respect to the recitation “the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400℃ or lower tempering treatment, or air cooling followed by a 400°C or lower tempering treatment” in claims 19-20 et al. (JP ‘823) discloses to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point.. Therefore, the same or a substantially similar structure would be expected.

With respect to the recitation “and the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer” in claims 19-20, the Examiner asserts that Oka et al. (JP ‘823) discloses amounts of copper and molybdenum effective to form this sulfide layer because Oka et al. (JP ‘823) discloses a substantially similar composition. MPEP 2112.01 I.

With respect to the recitation “the sulfide layer formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment" in claims 19-20, Oka et al. (JP ‘823) discloses a substantially similar composition. Therefore, formation of the sulfide layer would be expected when subjecting the alloy to a sulfur-containing environment. MPEP 2112.01 I.

With respect to the added recitation “and a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent

cooling is not conducted" in claims 19-20, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

In regards to claims 5-6, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown in the table below (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	-	0.001 – 0.05	-
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of

obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the "consisting of" transitional language in line 1 of claims 5-6 and the titanium content in Oka et al. (JP '823), the Examiner notes that Oka et al. (JP '823) discloses that titanium prevents hot working degradation due to sulfur [0020]. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to omit titanium where prevention of degradation due to sulfur would not be required or desired. MPEP 2144.04 II. Alternatively, the Examiner notes that Oka et al. (JP '823) discloses that calcium also prevents hot working degradation due to sulfur [0021]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute calcium for titanium within the disclosed range of 0.001 to 0.01 weight percent in order to achieve equivalent prevention of degradation due to sulfur absent the titanium. MPEP 2144.06.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 5-6, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides

in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 5 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 6, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. (JP '823) such that the formula would be satisfied because Oka et al. (JP '823) discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 7 of claim 7 and line 6 of claim 8, Oka et al. (JP '823) discloses the presence of impurities (abstract).

With respect to the added recitation "and a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted" in claims 5-6, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not

higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

In regards to claims 17-18, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown below (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	-	0.001 – 0.05	-
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses

the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 17-18, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 17 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 18, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. ('520) such that the formula would be satisfied because Oka et al. (JP '823) discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 6 of claims 17-18, Oka et al. (JP '823) discloses the presence of presence of impurities (abstract).

With respect to the "consisting of" transitional language in line 2 of claims 17-18 and the titanium content in Oka et al. (JP '823), the Examiner notes that Oka et al. (JP '823) discloses that titanium prevents hot working degradation due to sulfur [0020]. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to omit titanium where prevention of degradation due to sulfur would not be required or desired. MPEP 2144.04 II. Alternatively, the Examiner notes that Oka et al. (JP '823) discloses that calcium also prevents hot working degradation due to sulfur [0021]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute calcium for titanium within the disclosed range of 0.001 to 0.01 weight percent in order to achieve equivalent prevention of degradation due to sulfur absent the titanium. MPEP 2144.06.

With respect to the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400℃ or lower tempering treatment, or air cooling followed by a 400°C or lower tempering treatment" in claims 17-18 et al. (JP '823) discloses to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point.. Therefore, the same or a substantially similar structure would be expected.

With respect to the recitation "and the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer" in claims 17-18, the Examiner asserts that Oka et al. (JP '823) discloses amounts of copper and molybdenum effective to form

this sulfide layer because Oka et al. (JP '823) discloses a substantially similar composition. MPEP 2112.01 I.

With respect to the recitation "the sulfide layer formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment" in claims 17-18, Oka et al. (JP '823) discloses a substantially similar composition. Therefore, formation of the sulfide layer would be expected when subjecting the alloy to a sulfur-containing environment. MPEP 2112.01 I.

With respect to the added recitation "and a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted" in claims 17-18, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

Response to Arguments

Applicant's arguments filed 21 December 2010 have been fully considered but they are not persuasive.

The Applicant primarily argues that the position that the hardness range and amount of carbides limitation are inherently present in Oka et al. (JP '823) is in error since the claimed invention is premised on suppressing precipitation of carbides along

the grain boundaries of prior austenite, so that as-quenched condition as being subjected to rapid cooling or air cooling from austenite territory is based, or if any tempering, the tempering at the temperature that inhibits carbides from precipitating along grain boundaries is based. The Applicant further argues that in the process of making Oka et al. (JP '823), even if the precipitation amount of intergranular carbides should be suppressed after completion of steps (1) and (2), reheating in step (3) should allow part of the carbon to form carbides and tempering is nothing more than ordinary which includes tempering at 500°C or more and Oka et al. (JP '823) neither describes nor implies that tempering shall be performed at 400℃ or less and there is no legitimate basis for the Examiner to assume that the limitations missing in Oka et al. (JP '823) are somehow present.

In response, the Examiner notes that Oka et al. (JP '823) meets the limitation of "wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted" is met. Therefore a yield strength of not less than 815 MPa would be expected in Oka et al. (JP '823). Additionally, Applicant has not shown that Oka et al. (JP '823) would have carbides in grain boundaries at a level of more than 0.13 volume percent.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art Unit 1733

/JR/